THE ZOOLOGIST

No. 711.—September, 1900.

THE ADDER-SWALLOWING THEORY FROM AN ANATOMICAL POINT OF VIEW.

By Gerald Leighton, M.B.

The main objections of scientific naturalists to the belief that the Adder-mother (*Vipera berus*) swallows her young are the following:—First, that no Adder has been dissected by a competent authority with the young found in the gullet. Secondly, that the cubic capacity of the gullet is not sufficient to hold *all* the young ones in a litter. Thirdly, some (F. G. Aflalo, *e.g.*) hold that there is no adequate reason for the phenomenon, *i.e.* that the young ones would have a better chance of escape if they were not thus swallowed. Of these objections, the second is by far the most pressing to my mind, for if it could be shown that the gullet of the Adder is not capacious enough to hold the *average number of* young, then indeed one could not have much belief in the occurrence. It is this point that I wish to deal with at present. One must settle—

1st. What is the average number of young at a birth?

2nd. Is the anatomical structure of the gullet adapted for the reception of young?

3rd. Is the capacity of the gullet sufficient?

These are practical questions, only capable of decision by dissection of a sufficient number of adult female Adders. Take them *seriatim*.

1st. *The average number of young Adders at a birth.*

Various authorities give different figures: thus Dr. Stradling puts the litter at from *15 to 40*, M. C. Cooke at 10 to 20. My own experience leads me to doubt very seriously whether Adders ever have forty young at once. I have dissected now a considerable number of full-grown female Adders in young (three this week), one of which I will now describe in detail.

Dissection of Gravid Female.—On Monday, July 23rd, I dissected a large gravid female Adder for the purpose of counting the number of young that had developed. A mesial incision was made from the position of the ovaries to the cloaca, and the skin turned outwards. Both oviducts were full of eggs. The upper and lower ends of the oviducts were tied with string, and the other organs gently separated. Both oviducts were then lifted out of the body cavity. The dissection showed the blood supply very beautifully, and the young were evidently only a day or two from birth. I took a photo of the full oviducts, as one cannot often get an Adder at this stage. The right oviduct contained seven and the left six eggs. (An egg often contains two embryos.) The specimen was such a perfect one that I thought I would preserve it *in toto* to harden, so as to observe later the precise position of the embryo in the egg. This being so, I could not be quite certain as to their number, but I think it is 19 or 20. The average of this series of dissections works out at *thirteen* embryos to each female Adder. (The eggs often contain more than one embryo; in this latter case there were thirteen eggs containing the eighteen embryos.) Possibly a larger series of dissections might give slightly different results, but I do not think the difference is likely to be great. To be on the safe side (as far as the question of capacity is concerned), let us consider the average to be *fifteen*.

2nd. *The anatomical fitness of the gullet for their reception.*

This is soon disposed of, as the Adder's gullet is, of course, adapted to its food. There is no difficulty whatever for a Mouse, a young Water Vole, or a Blindworm to pass into the gullet, and it is quite easy to press them out again if they are contained therein. (A short time ago I killed an Adder which appeared

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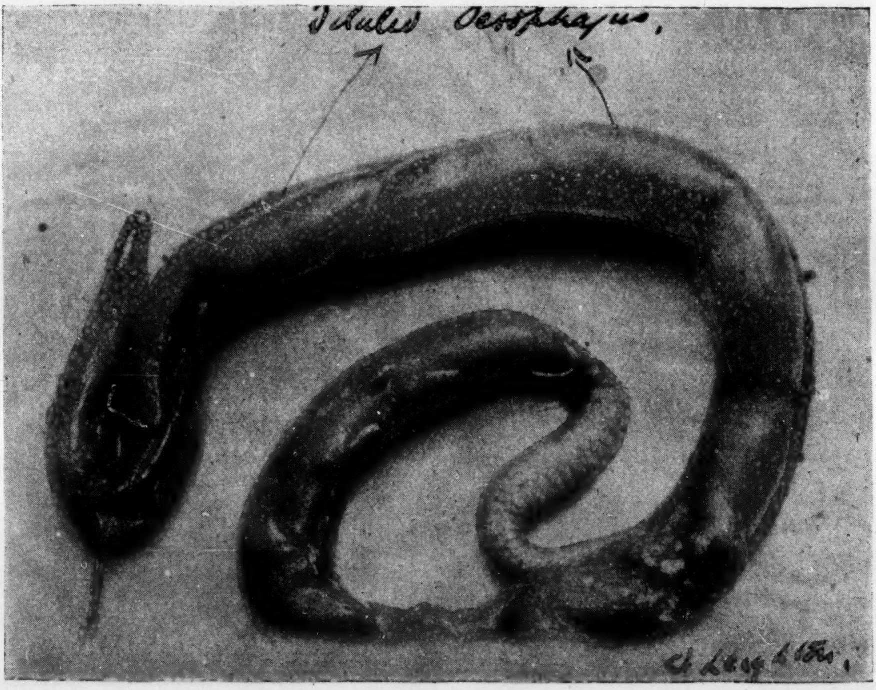
very full in the throat, and, on gentle pressure, I got out two young Water Voles.) The mechanism of the jaws is indeed peculiarly fitted for the passage of bulky articles of food, a feature common to the Ophidia group.

3rd. *The cubic capacity of the œsophagus* (*gullet*).

This is a crucial point. If the Adder does swallow her young it is to be presumed that there must be room in every average-sized Adder's gullet for an average-sized family. The capacity of the gullet can be estimated by the simple process of dilating it to its full extent with air through a blowpipe. I did this in the presence of a naturalist last week; his comment was, "There is room for twenty young ones, but for forty I think not." The average length of the gullet is 9 in., and the average diameter, when distended, 1 in., the average circumference 3⅓ in. Young Adders can curl themselves up in a remarkable way, and I have no hesitation in saying that the *capacity of the œsophagus is sufficient to hold the young*. My conclusion is that, theoretically considered, there is *no anatomical reason* why the Adder-swallowing theory should not be true.



The third objection I alluded to, *viz.* that there is no need for the process, is a mere matter of opinion. Very curious instances could be given of the expression of maternal instincts in nature.

It only remains, then, for the first objection to be removed, *viz.* that a competent authority should have the opportunity of dissecting an Adder which has been observed to swallow the young. Until this is done scientific naturalists will continue to regard the question as one capable of proof, if true, but hitherto unproved.

THE BIRDS OF GREAT YARMOUTH AND THE NEIGHBOURHOOD.

BY ARTHUR PATTERSON.

(Continued from p. 172.)

The arrangement and nomenclature of Howard Saunders in his 'Manual of British Birds' has been adopted in the following catalogue.

ABBREVIATIONS.—C. means common; F. frequent; F. C. fairly common; N. U. not uncommon; N. C. not common; F. frequent; L. L. lessening locally; S. scarce; R. R. rather rare; R. rare; A. accidental. B. of N. means 'Birds of Norfolk' (Stevenson); B. of S. means 'Birds of Suffolk' (Babington); Nor. N. S. means 'Transactions' of the Norfolk and Norwich Naturalists' Society.

Turdus viscivorus. Mistle-Thrush.—L. L. Nested in market-gardens until end of seventies. Young birds from surrounding villages frequent the sand-dunes in the early autumn, seeking insects. Some scattered mulberry trees (themselves extirpated) were at one time an attraction. Buff variety shot, June 18th, 1898. Local, "Fulfer."

T. musicus. Song-Thrush.—C. Additions in autumn. Its services in autumn in destroying the Coleoptera and *Limacidæ* on strawberry-beds are not appreciated by country gardeners.

T. iliacus. Redwing.—C. Numbers depend upon severity of winter. In winters of 1878 and 1881 were starving by thousands. Caught by boys with their caps in the streets. Local, "French Mavish."

T. pilaris. Fieldfare.—C. Numbers fluctuate with weather. In mild winters very few. November, 1891, thousands on neighbouring marshes. Found several dead on 8th on the beach. Example washed up on April 23rd, 1893; undoubtedly a late emigrant. Local, "French Fulfer."

T. varius. White's Thrush.—A. A male example obtained at Hickling, Oct. 10th, 1871. This, the only Norfolk specimen, is in Norwich Museum.

T. merula. Blackbird.—C. Appears to be on the increase. Occasionally great numbers arrive in autumn. Have met with cream, buff, and mottled varieties.

T. torquatus. Ring-Ouzel.—R. R. Occurs in spring; less rarely in autumn. At one time not infrequent on North Denes, haunting the furze, amongst which *Helix nemoralis* was abundant. Nest discovered at Horsey by late Mr. Rising in May, 1855, containing four eggs. A second nest subsequently. (Nor. N. S.).

Saxicola œnanthe. Wheatear.—C. Scarcer than formerly; nesting at one time on North Denes, and occasionally now on neighbouring warrens. Immature birds fairly common towards September; then patrol the shore catching dipterous insects, which swarm at the high-water mark. Mr. E. Saunders had a pied variety, September, 1898. Unusually numerous, spring of 1899. Local, "White-rump"; "Shepherd-bird."

Pratincola rubetra. Whinchat.—L. L. Used formerly to be abundant on North Denes, nesting there. Local, "Furzechuck."

P. rubicola. Stonechat. — L. L.—Formerly fairly abundant on North Denes. Local, "Furzechuck."

Ruticilla phœnicurus. Redstart.—F. More frequently observed in autumn in the neighbourhood of North Denes. Local, "Fire-tail."

R. titys. Black Redstart. R. R.—First observed as a county visitant, Oct. 31st, 1848. Adult female shot on North Denes. Two others following year; several since. I picked up an example, killed by telegraph-wires, same locality, Oct. 18th, 1898.

Cyanecula suecica. Bluethroat. — R. An adult male was found dead on the beach, Sept. 21st, 1841; and another at Lowestoft in May, 1856. A local gunner, "seeking for any small bird, just to empty his gun at," killed a specimen on Breydon walls in September, 1883. Another recorded at Horsey, 1885.

Erithacus rubecula. Redbreast.—C. Additional numbers in autumn. I have seen it arrive on the coast.

Daulias luscinia. Nightingale. — F. Not uncommon at Fritton, and in neighbourhood of Belton. I have observed it on a tree-trunk warbling in broad daylight.

Sylvia cinerea. Whitethroat.—C. Abundant in summer all over the neighbourhood.

S. curruca. Lesser Whitethroat.—R. R. By no means so plentiful as *S. cinerea.*

S. atricapilla. Blackcap. — S. Occasionally observed in market-gardens, and near Fritton.

S. hortensis. Garden-Warbler.— S. Less often seen than even the Blackcap.

S. undata. Dartford Warbler.—R. Has twice been seen on North Denes. The second example was caught by a dog in a furze-bush, Feb. 25th, 1859 (B. of N.). In 1884 Sir Edward Newton saw one at Lowestoft.

Regulus cristatus. Golden-crested Wren. — C. Immense numbers arrive in autumn, usually first week in October, as was particularly the case in October, 1882, and again in October, 1898. Fishing-boats often swarmed with tired birds. Local, "Herring-spink."

R. ignicapillus. Fire-crested Wren.—R. Two or three times observed in the neighbourhood. A male in market-gardens, April, 1889. One caught on a smack at sea, December, 1881.

Phylloscopus rufus. Chiffchaff.—C. Used to be abundant in market-gardens in March.

P. trochilus. Willow-Wren.—C. Frequently seen and heard in neighbourhood on spring migration. A singular variety of a uniform pale yellow, becoming straw-coloured below, killed near Lowestoft in August, 1861 (B. of N.).

Acrocephalus streperus. Reed-Warbler.—F. C. Met with in the Broadland district; its name suggests its habitat. The nest has been observed at Ranworth, built in laurel-bushes by the water's edge (B. of N.).

A. phragmitis. Sedge-Warbler.—C. Found in every "carr," reed-clump, and waterside thicket. Heard at intervals night and day "chitty cha-ing" by the idler on the broads and rivers. Local, "Reed-bird."

Locustella nævia. Grasshopper-Warbler.—R. "Occasionally met with, but rare" (Paget). As a county visitant it is by no means numerous.

L. lusciniodes. Savi's Warbler. — A. A nest of this species is said to have been found near Yarmouth, which was sent to Mr. Newcome's collection at Feltwell (B. of N. vol. i. p. 113).

Accentor modularis. Hedge-Sparrow.—C. More frequent in town gardens in winter, when its familiar notes are frequently heard.

A. collaris. Alpine Accentor.—A. On Sept. 21st, 1894, I met with an example on Gorleston pier. It was feeding amongst the weeded pile-stumps and stones under the pier, and allowed me to approach it very closely, when I carefully observed its plumage and actions for some time through my glasses. Mr. Stevenson (B. of N. vol. i. p. 90) has not included this species, but refers to Mr. Lubbock as having seen one in 1824 on a grass-plot at Oulton, near Lowestoft. He refers to one other only for the eastern counties.

Cinclus aquaticus. Dipper.—R. An example shot on Breydon walls in 1849 (Nor. N. S. vol. iv. p. 269).

C. melanogaster. Black-breasted Dipper.—R. An example of this Scandinavian form obtained on the River Bure, Nov. 9th, 1896 (Nor. N. S. vol. vi. p. 506).

Panurus biarmicus. Bearded Titmouse. — F. Nests decreasing on the Broads; mercilessly persecuted by broadmen and others. Eight killed by duckshot, brought to market Nov. 19th, 1890; seven of these mutilated specimens still unsold on the 22nd. Four killed at Filby; on sale Feb. 1st, 1895. Mr. J. H. Gurney (Nor. N. S. vol. vi. p. 429) estimates ratio of local nests as follows:—1848, 160;* 1858, 140; 1868, 125; 1878, 90; 1888, 45; 1898, 33. Is locally known as the "Reed-pheasant."

Acredula caudata. Long-tailed Titmouse.—C. A regular although uncertain visitor in autumn. Resident and migratorial. Hundreds in town gardens, Oct. 1st, 1899. The Rev. Churchill Babington says the White-headed Long-tailed Tit has been met with in Norfolk, probably referring to the neighbourhood of Yarmouth.

Parus major. Great Titmouse. — C. Often numerous in early winter; this increase points to a migratorial influx. Has been secured on lightships. "An apparently (return) migratory movement was observed at Yarmouth in February, 1848" (B. of N. vol. i. p. 140).

P. britannicus. Coal-Titmouse.—F. C. I saw a large flock near the sea, on the North Denes, Nov. 5th, 1893. Suspecting they were immigrants, possibly *P. ater*.

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* Mr. Gurney has since estimated the number of nests for this year as 170 (*cf. ante*, p. 363).—Ed.

P. palustris. Marsh-Titmouse. — F. C. I have no doubt this species is migratorial. Found on the marshy districts north and south of the town.

P. cæruleus. Blue Titmouse.—C. Much more in evidence in late autumn than at any other time. Local, "Pick-cheese."

P. cristatus. Crested Titmouse. — A. In the autumn of 1888 or 1889 (date unfortunately lost), I saw a bird which was unmistakably of this species among the firs on Caister Road. I had a gun at the time, and made two unsuccessful attempts to assassinate it with big shot. I followed it from tree to tree ; becoming myself fast upon a nail protruding from a rail, it eluded me whilst endeavouring to extricate my nether garment. Has not hitherto been obtained in Norfolk. Has occurred, according to Babington, in Suffolk.

Sitta cæsia. Nuthatch.—R. R. Not uncommon in the Fritton woods and neighbourhood.

Troglodytes parvulus. Wren.—C. The autumnal additions appear to strike the coast higher up, and to work southward by land; then not in any numbers. Local, "Jenny Wren."

Certhia familiaris. Tree-Creeper.—R. R. Have observed it in the Fritton district.

Motacilla lugubris. Pied Wagtail. — C. Although not so numerous with us as formerly, a few remain in winter, a number arriving from the south in spring. Local, "Penny Wagtail."

M. alba. White Wagtail.—R. Two male examples obtained here on April 24th, 1888 ; a third on May 1st of the same year; another was taken alive at Lound, April 25th, 1896, and lived for some time in confinement.

M. melanope. Grey Wagtail.—R. The Messrs. Paget speak of it as not uncommon in winter. I have observed it in late autumn, recognizing it by its longer tail and more dipping flight as compared with others of this family. An example feeding against my boat-house doors, Dec. 27th, 1899.

M. flava. Blue-headed Wagtail. — R. Mr. E. T. Booth watched some on the edge of Breydon (Nor. N. S.). The second for the county was shot in April, 1851. One or two others recorded for district. Nest containing four eggs found at Herringfleet, June 16th, 1842, attributed to this species by the late Mr. Fisher.

M. raii. Yellow Wagtail.—C. Abundant in some years on marshlands. Males arriving "yellow as a guinea," by autumn have assumed a dingy hue.

Anthus trivialis. Tree-Pipit.—F. C. Has occasionally been taken in market-gardens. Also observed in neighbourhood of Belton.

A. pratensis. Meadow-Pipit.—C. More numerous in winter than in summer; frequenting salt marshes. Young birds in autumn often seen catching "sand-flies" at the high-water mark in company with young *Saxicola œnanthe.* Local, "Titlark."

A. campestris. Tawny Pipit.—R. A female caught in a clap-net on North Denes, Oct. 7th, 1897. One at Lowestoft, Sept. 2nd, 1889 (Nor. N. S. vol. vi. p. 508).

A. richardi. Richard's Pipit.—R. Several times taken or shot on North Denes: three respectively in November, 1841; April, 1842; and April, 1843. Mr. Babington records occurrences as follows:—One, marshes at Yarmouth, Dec. 26th, 1866; another, Dec. 27th; a third, Dec. 29th. The last occurrence was on Dec. 11th, 1894.

A. obscurus. Rock-Pipit.—F. C. I have frequently observed this species in autumn on the Bure and Breydon flint-faced walls. Have never seen it beside other than salt water.

A. rupestris. Scandinavian Rock-Pipit.—R. Mr. Booth secured an example at Horsey in March, 1871 (Nor. N. S. vol. iv. p. 277).

Oriolus galbula. Golden Oriole.—R. Has rarely put in an appearance in summer. A female killed near Yarmouth, Aug. 1st, 1850; another, probably the male, seen at the same time (B. of N.). Mr. E. T. Booth ('Catalogue of Birds') says he had seen nest and eggs in Norfolk. I have some recollection of a pair attempting to nest near Ormesby in the early eighties. One seen at Burgh Castle, May, 1883.

Lanius excubitor. Great Grey Shrike.—R. R. Visits us rarely in late autumn. Three or four met with January and February, 1891. One I kept alive, quickly became tame, taking his bath very soon after capture.

L. minor. Lesser Grey Shrike.—R. One shot in the spring of 1869; another taken in May, 1875. Both of them adults. (Nor. N. S.).

L. collurio. Red-backed Shrike.—R. R. Nested on North

Denes up till the eighties. Have observed it feeding on the Field Vole (*Microtus agrestis*). Have observed young birds once since. Less frequent than formerly. Local, "Butcher-bird."

L. pomeranus. Woodchat Shrike.—R. An example obtained at Bradwell, April, 1829; another, April 29th, 1859; and a third, May, 1885. One also at Gorleston.

Ampelis garrulus. Waxwing. — R. R. An uncertain winter visitor. In some years arrives in most unexpected numbers; in others few, if any, are recorded. Early in 1893, several obtained in neighbourhood.

Muscicapa grisola. Spotted Flycatcher.—F. Have observed it darting at passing flies from a gravestone in Yarmouth churchyard, returning again to its look-out to watch for others.

M. atricapilla. Pied Flycatcher.—R. R. Unusual numbers observed on North Denes, June 1st, 1898.

M. parva. Red-breasted Flycatcher. — A. An immature female shot at Rollesby, Dec. 12th, 1896; the fourth example for the county, two of the others occurring in September, the third in October.

Hirundo rustica. Swallow.—C. Less frequently nesting in town; its nests are common enough in the pump-mills dotting the marshes, where they are found variously shaped, sometimes like a saucer on top a beam, at another fitting a hole formed by the crumbling of a brick. In 1878 a pair nested in the hold of a hulk, full of water, in the centre of Breydon, successfully rearing their young.

Chelidon urbica. Martin.—C. Have almost altogether forsaken the town through the persecution of the Sparrows, and from the constant destruction of their nests from the mud being rendered unstable, the roads being watered with sea-water.

Cotile riparia. Sand-Martin.—C. Last nested in sand-hills on North Denes in 1879. Great numbers come into the vicinity of the town in autumn; frequents the beach during westerly winds, seeking insects. Have found its nest in the Gorleston sand-cliffs lined with *Flustra folicea* and Gull's feathers.

Ligurinus chloris. Greenfinch. — C. Much persecuted by gardeners at radish-sowing-time, when, in company with Chaffinches, pilfering the beds. Augmented by arrivals in autumn, but they appear to strike the coast some miles north of Yarmouth, working, with other Passeres, southward along the sand-hills. Local, "Green Linnet."

Coccothraustes vulgaris. Hawfinch.—F. Visits us in uncertain numbers every winter. Have every reason to believe a pair tried to nest in a market-garden a few years ago, but were killed by a birdcatcher.

Carduelis elegans. Goldfinch.—L. L. Owing to incessant persecution by birdcatchers has so diminished of late years as to become almost a rarity with us. A hybrid between Goldfinch and Linnet netted at Acle, Sept. 4th, 1899.

Chrysomitris spinus. Siskin.—C. An uncertain autumn visitor, sometimes arriving in great numbers.

Serinus hortulanus. Serin Finch.—R. A male example shot at Yarmouth, June 13th, 1885; another netted on North Denes, Feb. 5th, 1887. A pair, April 1st, 1897 (Nor. N. S.).

Passer domesticus. House-Sparrow.—C. A great number repair all through the autumn to a clump of trees near St. Nicholas Church towards sunset, and chirp in chorus half an hour, making a great uproar, after which they disperse to their sleeping-quarters. Very destructive in villages around at harvest-time. One passed me within arm's length on Jan. 17th, 1881, coming from over sea with tired-out Twites, Linnets, &c. I am informed that during immigration some occasionally alight on lightships. My informant, an intelligent lightsman, on my suggesting he may possibly have mistaken Tree-Sparrows, distinctly referred to them as "House"-Sparrows, which he knew from *P. montanus.*

P. montanus. Tree-Sparrow.—F. C. Nests in the neighbourhood; I have found its nest under a tile in cart-shed. Have observed it arrive in October, alighting on sand-hills to rest after a tiring flight across seas.

Fringilla cœlebs. Chaffinch.—C. Great numbers arrive in autumn, many often perishing. Have observed it industriously feeding in winter on the seeds of *Astor tripolium.* The separation of the sexes is noticeable. Local, "Spink."

F. montifringilla. Brambling.—C. In some winters abundant. Winter of 1885–86 very numerous; again in 1894–95. Many dozens were caught by one birdcatcher who baited a certain meadow. Mr. J. H. Gurney (Nor. N. S. vol. iv. p. 278) refers to a rare "variety with a white chin, like a chevril Goldfinch," as having been killed at Yarmouth, where the black-chinned variety has also sometimes occurred.

Acanthis cannabina. Linnet.—C. Formerly nested in numbers on North Denes. Great accessions to numbers in October, when thousands are netted and sent to London. The female is generally killed, or saved, with Twites, &c., for shooting matches. Hybrids between the Linnet and Greenfinch have been taken two or three times.

A. linaria. Mealy Redpoll. — F. C. In uncertain numbers visits us with the autumnal inrush. Unusually numerous, autumn of 1893.

A. rufescens. Lesser Redpoll.—C. This species occasionally comes over in great numbers with Linnets, Twites, &c.

A. flavirostris. Twite. — C. In some years arrives in enormous flocks, and annoys the birdcatchers by their persistency in entering the clap-nets. Local, "French Linnet."

Pyrrhula europæa. Bullfinch. — F. C. Relentlessly shot, our market-gardeners assuming it to be unpardonably mischievous in orchards. It is apparently more numerous on the Suffolk side of the district. Local, "Blood-ulf."

P. major. Russian Bullfinch.—A. A male was shot on the Denes near Yarmouth on Jan. 22nd, 1893 (Nor. N. S.). Yorkshire is the only other county in which the Russian Bullfinch has been at present identified.

[*P. enucleator.* Pine-Grosbeak.— A. A flight supposed to have been seen on the Denes, November, 1822 (*vide* Paget). Mr. J. H. Gurney thinks this very doubtful.]

Loxia curvirostra. Crossbill.—F. Small flocks occasionally arrive in autumn. Several were seen for several weeks at Somerton and Belton quite into the nesting season. Largest influx for many years past, first week in Aug. 1898, when Lowne had thirty-two in for preservation. Paying great attention to cherry trees and gooseberry bushes. I saw several both "red" and "green." Mr. Dye kept one in a cage six and a half years. A variety of the Crossbill which was erroneously recorded at the time as the Two-barred Crossbill was probably *Loxia rubrifasciata.*

L. bifasciata. Two-barred Crossbill. — A. On Sept. 1st, 1889, a male example was shot at Burgh Castle, near Yarmouth

(Nor. N. S.). An example of the American variety (*L. leucoptera*) is said to have been taken on the rigging of a vessel which arrived at Yarmouth in October, 1870 (*vide* B. of N. vol. iii. p. 413).

Emberiza miliaria. Corn-Bunting.—F. C. Not often observed in this immediate neighbourhood.

E. citrinella. Yellow Bunting.—C. Formerly nested on North Denes. Receives additions in winter from the more northern counties. A very conspicuous tenant of the hedgerows during winter. Local, "Guler"; "Yellowhammer."

E. cirlus. Cirl Bunting.—R. Two specimens of this bird were obtained by Mr. E. T. Booth at Hickling in the autumn of 1875 (Nor. N. S.). Two males netted on Breydon marshes during severe frost, Jan. 29th, 1888. (*Ibid.*)

E. hortulana. Ortolan Bunting.—A. An example netted at Yarmouth, April, 1866 (B. of N.). Six are said to have been caught here in May, 1871. One, Lowestoft Denes, May 5th, 1859.

E. schœniclus. Reed-Bunting.—C. Abundant in the neighbourhood of the rivers and broads. I remember several years ago seeing an osier-carr near Acle swarming with them in late autumn; possibly migratory arrivals. Local, "Reed-Sparrow."

Calcarius lapponicus. Lapland Bunting.—N. C. Migrants arrive every winter in greater or less numbers. In October and November, 1892, considerable numbers seen and caught on North Denes. Over fifty taken or shot. More seen in 1893. Are now looked for by birdcatchers, who are not slow to observe distinguishing peculiarities of possible strangers. They mix freely with Snow-Buntings.

Plectrophenax nivalis. Snow-Bunting.—C. In some winters abundant on the marshes and North and South Denes. On the former they industriously feed on the seeds of *Astor tripolium*; on the latter, on those of various "dune" plants uncovered by the varying winds. Earliest recorded arrival, Sept. 11th, 1897, at Belton. Local, "Snow-bird"; "Snow-bunting"; "Snowmen."

Sturnus vulgaris. Starling.—C. It is most interesting to see in autumn continual parties arriving to roost on the reeds towards sunset in the broadlands. The huge flocks that used to wheel in aerial manœuvrings over the marshes are not now so frequently seen. Immense numbers arrive in autumn. It is a common thing to hear the Starlings on town chimneys most accurately mimicking the Curlew, Golden Plover, &c. It is often seen hovering over Breydon with Gulls, picking up floating refuse; and in summer sometimes aping Swallows catching insects on the wing. In September, 1899, an escaped *Molothrus bonariensis* attached itself for some time to a flock of Starlings, which its black colour closely resembled.

Pastor roseus. Rose-coloured Starling.—R. Paget records three: one shot by Capt. Manby near the hospital, April, 1820; a fine male shot at Lound in June, 1851; a female was obtained at Yarmouth in September, 1856.

Nucifraga caryocatactes. Nutcracker. — R. One shot at Rollesby, Oct. 30th, 1844; another shot off Yarmouth, Oct. 7th, 1853 (Nor. N. S. vol. iv. p. 283).

Garrulus glandarius. Jay. — L. L. Still found and persecuted in the wooded districts south of Yarmouth.

Pica rustica. Magpie.—L. L. Frequenting same locality as the Jay, has meted out to it the same fate. When living in Dublin, in 1890, I was surprised at the tame audacity of this species, which seemed somewhat numerous in Phœnix Park. At the Gardens they would alight near one's seat, and snap up titbits thrown to them.

Corvus monedula. Jackdaw. — Nests in one or two village churches north of Yarmouth; used to nest in the chimney of a high old house in heart of the town. On its recent demolition I saw in a niche about twenty well-preserved skeletons of young birds. Great numbers arrive with other *Corvidæ*. Early morning flights usually fly high and noisily. Some flying north, Feb. 17th, 1892.

C. corax. Raven.—A. "Now rarely seen" (Paget). I have recognized it only on one or two occasions flying overhead in autumn.

C. corone. Carrion-Crow. — L. L. Have occasionally met with it on Breydon flats, where Rooks also at times congregate in some numbers.

C. cornix. Hooded Crow.—C. Great numbers usually pass over in autumn, many locating for the winter in the neighbourhood. In severe weather becomes predaceous; have then known it seize wounded birds in presence of the gunners. Six observed on the marshes as early as June 22nd, 1896; while in 1894 I saw seven on July 31st. Great gathering on Breydon mud-flats prior to leaving, on March 31st, 1898. Local, "Grey Crow"; "Kentish Crow."

C. frugilegus. Rook.—C. Apparently increasing. Not much molested, as the natives have formed a better opinion of it than formerly. Great flights from over sea in autumn. On some days, as on Nov. 2nd and 3rd, 1899, incessant streams all day long; arriving also after dark. Many assume omnivorous tendencies, patrolling the shore and mud-flats for edible refuse. I once saw one catch a "Tartar" in a live Crab, which seized it by the throat. Have observed departures from Scratby cliffs in March. In April, 1896, several visited a tree near the market-place. A pair nested, but the young being disturbed, they have not since attempted to nest there.

Alauda arvensis. Sky-Lark.—C. All the year round. Enormous influxes of a dark (Scandinavian) form in autumn. A noteworthy invasion on Feb. 3rd, 1897, when coarse weather from south-east followed. During protracted snows in November, 1890, cabbages in surrounding gardens were reduced to shreds by them; at Belton, during open weather in October, 1896, cabbage patches were ruined by them.

A. arborea. Wood-Lark.—F. C. Mostly observed here in severe weather, in small parties. Seven shot in the snow by a gardener, Dec. 20th, 1890.

[*A. brachydactyla.* Short-toed Lark.—A. One stated to have been shot on Breydon walls, Nov. 7th, 1889. The bird in question may have been an escape (*vide* B. of N. vol. iii. p. 410).]

Otocorys alpestris. Shore-Lark. — F. C. Uncertain winter visitor; sometimes occurs in considerable numbers, as in October, 1880. Consorts with Snow-Buntings on North Denes and sand-hills. The birdcatchers have learnt to distinguish its call-note and characteristics, and look for it yearly. About sixty were obtained during autumn and winter of 1882, mostly males.

Cypselus apus. Swift. — C. The numbers nesting here do not increase, although gathering in considerable numbers over the Denes in early autumn. A favourite prey is the St. Mark's Fly (*Bibio marci*). During a set-in of unusually cold weather in August, 1881, numbers of Swifts were picked up dead or benumbed. Local, "Davelin."

C. melba. Alpine Swift.—A. One shot on Smith's marsh, Breydon walls, by Alfred Andrews, Sept. 4th, 1872. It was stuffed badly by Harvey, restuffed by James Carter, and again restuffed by Gunn.

Caprimulgus europæus. Nightjar.—F. C. Occasionally seen in recreation-ground near the beach moth hunting.

Iÿnx torquilla. Wryneck.—N. C. In the Paget's list it is referred to as "not uncommon." Have seen examples from Fritton Wood. Local, "Cuckoo's Mate."

Gecinus viridis. Green Woodpecker. — N. C. Occasionally brought to market. Nests at Fritton.

Dendrocopus major. Great Spotted Woodpecker. — N. C. Migrates hither occasionally in some numbers. I obtained one caught alive on a fishing-lugger, Oct. 8th, 1898.

D. minor. Lesser Spotted Woodpecker. — R. R. A female example was picked up on Yarmouth beach some years ago, which suggests a probable migratory habit. A specimen in the market recently. The Messrs. Paget record it as "very rare." Babington (B. of S.) gives it as nesting at Fritton.

Alcedo ispida. Kingfisher.—F. C. Nests occasionally in the neighbourhood. Additions in autumn, working southwards. Unusually numerous in September, 1878, when dozens were shot! I saw eighteen during one morning's walk by the Bure. Its protection should be made imperative.

Coracias garrulus. Roller.—R. Like all other richly attired immigrants, it is shot as soon as it arrives. Several are recorded for this neighbourhood. One killed about 1817; one taken in rigging of a vessel off Yarmouth, May 25th, 1865 (B. of N.); an example obtained at Bradwell, Oct. 9th, 1883; also at Burgh Castle, Sept. 29th, 1892.

Merops apiaster. Bee-Eater.—R. One recorded by Shepperd and Whitear at Yarmouth (B. of N.). Lubbock, writing in 1848, says one "was killed lately at Yarmouth."

Upupa epops. Hoopoe.—R. "One or two," say the Messrs. Paget, "generally met with in the autumn." Three were shot at different times in the market-gardens. A worn-out gunner is still living who boasts of locally shooting four of these birds at various times. One on Hasborough lightship. April, 1884 (Nor. N. S.). Mr. Dawson Turner informed the late Mr. J. H. Gurney that after a gale fifteen were brought him (B. of S. p. 98). One at Horsey, Oct. 9th, 1882. Dead example found on the Vauxhall line, April 15th, 1899, having probably struck telegraph-wires.

Cuculus canorus. Cuckoo.—C. Have known a single individual clear a cabbage-patch of the larvæ of *Pieris brassicæ* in a few days. I once reared one from the nest on bullock's lights. It was exceedingly pugnacious, and grew amazingly fast.

Coccystes glandarius. Great Spotted Cuckoo.—A. A young male was shot on Caister denes on Oct. 18th, 1896. Had been feeding on the larvæ of the Buff-tip Moth (*vide* Nor. N. S. vol. vi. p. 509).

Strix flammea. Barn-Owl. — C. Have observed it arrive early in the morning with autumnal immigrants. Still wantonly destroyed by many fools entrusted with guns.

Asio otus. Long-eared Owl.—N. C. "Rarely seen" (Paget). Examples occasionally brought up to market dead in winter months; two in the market, Dec. 16th, 1899.

A. accipitrinus. Short-eared Owl.— C. Sometimes arrives in considerable numbers in autumn; in other years scarce. Occasionally nests. A nest containing five eggs was discovered in a field of rushes not far from the sea in the neighbourhood of the Broads on May 2nd, 1898 (Zool. 1899, p. 119). I have observed this bird hunt in broad daylight. Coming over simultaneously with the Woodcock, is locally named "Woodcock-Owl."

Syrnium aluco. Tawny Owl.—R. Constant persecution has made this species (which the Pagets described as "common") rare with us.

Nyctala tengmalmi. Tengmalm's Owl.—A. "A single specimen is recorded by Messrs. Gurney and Fisher to have been taken some years since at Bradwell" (B. of N. vol. i. p. 60).

Athene noctua. Little Owl.—A. "Very rare; two specimens are well authenticated" (Paget). A male example brought alive into Yarmouth from sea, February, 1862 (Nor. N. S. vol. iv. p. 267). A female shot in the grounds of Naval Hospital, April 21st, 1881.

[*Nyctea scandiaca.* Snowy Owl.—A. "The late Mr. Stephen Miller, of Yarmouth, had a specimen of this noble bird, which, if not obtained in this district, was most probably British killed" (B. of N. vol. i. p. 58).]

Scops giu. Scops-Owl.—A. "Norfolk is accredited with six occurrences—two at Yarmouth" (Nor. N. S. vol. iv. p. 267). Mr. J. H. Gurney has one caught at Cromer Lighthouse, November, 1861. I distinctly remember one taken at Lowestoft Lighthouse some years ago, but can trace no printed record. One killed at Martham, June 1st, 1891.

Circus æruginosus. Marsh-Harrier.—R. The Messrs. Paget record it as "rather rare." In the earlier part of the century was not uncommon on the Broads, where it nested. Now only occasionally seen. Last nested in the Broad district in 1878.

C. cyaneus. Hen-Harrier.—R. R. Becoming rarer year by year, thanks to game-preservers and others. "Not uncommon" (Paget). Occasionally brought to market from the Broad district in hard winters.

C. cineraceus. Montagu's Harrier. — R. R. Rarely nests on the Broads. Mr. J. H. Gurney estimates six nests for 1858, but only one for 1898 (Zool. 1899, p. 115). More often met with than the two preceding. One caught in a bird-net on North Denes, April 28th, 1891.

Buteo vulgaris. Common Buzzard. — R. R. Occasionally turning up in autumn and winter in some numbers, as in September, 1881, when several were killed. I saw three washed up dead on the beach after a gale in the same month. The Messrs. Paget refer to it as "not uncommon." One taken off Flegg Burgh, Nov. 16th, 1897.

B. lagopus. Rough-legged Buzzard. — N. C. In November occasionally arrives in some numbers. Two or three winters sometimes elapse without an example being recorded. The winter of 1839–40 was a noted year for *B. lagopus* in Norfolk; again numerous in autumn of 1858, when "about twenty specimens were obtained, principally in the neighbourhood of Thetford and Yarmouth"; and again in some numbers in September, 1881.

Haliaëtus albicilla. White-tailed Eagle.—A. Rarely seen, and then always in immature plumage. Messrs. Paget record six occurrences: "The late Mr. Girdlestone . . . informed Mr. Lubbock that in the sharp winter of 1837 'he had seen three of these Eagles in sight at once' on Horsey warren" (B. of N. vol. i. p. 4). Several since recorded. One of two shot at Winterton in winter of 1856–7 was found to have been feeding on the remains of a Whale stranded on the beach there. One taken alive in decoy at Fritton, December, 1878. I observed one circling high above head, autumn of 1879. Example shot at Belton, Dec. 9th, 1882; one on Breydon, May 2nd, 1892.

Astur palumbarius. Gos-Hawk.—R. "Very rare—a fine specimen shot in 1833" (Paget). A male taken at Catfield in April, 1854; a female taken on a fishing-boat off Yarmouth in 1886 (Connop Catalogue); an adult female at Somerleyton, March 29th, 1893.

Accipiter nisus. Sparrow-Hawk.—F. C. Receives additions in the autumn. An unusual invasion in September, 1881. I found several dead on the beach after a gale; one struck a gas-lamp exhausted on the 22nd. The majority were females.

Milvus ictinus. Kite.—A. Very rare in the Pagets' time. Only occurs as an occasional passing migrant. An example killed at Martham, December, 1865.

Pernis apivorus. Honey-Buzzard.—R. An uncertain autumn visitor. Several shot in September, 1881; several records previous. One shot at Lound in September, 1882, had the crop filled with larvæ of Wasps (B. of S.). Babington also records one shot at Somerleyton in spring of 1854, in the stomach of which remains of Blackbird's eggs were found.

Falco peregrinus. Peregrine Falcon.—R. Occasionally shot on passage. The two or three I have seen in the flesh were males.

F. subbuteo. Hobby.—R. R. "Not uncommon in summer" (Paget). Has been once recorded at Yarmouth in February. A male example shot at Caister on Oct. 2nd, 1882 (Connop Catalogue).

F. vespertinus. Red-footed Falcon.—R. "One shot in a marsh by Breydon in 1832. . . . Three more were shot in same year at Horning" (Paget). An immature male specimen obtained at Somerleyton, July 12th, 1862.

F. æsalon. Merlin.—N. U. A fairly regular and not uncommon autumnal immigrant. Occasionally dashes into the nets of the birdcatchers. A young one caught at sea, Oct. 11th, 1882. I have observed it dead on the beach.

F. tinnunculus. Kestrel.—C. Still fairly common, and in autumn it is nothing unusual to see three or four at once "hovering" in different directions across the marshlands. Additions in autumn. Local, "Wind-hoverer."

Pandion haliaëtus. Osprey.—R. R. "One or two shot nearly every year on Breydon or the Broads" (Paget). Was undoubtedly more common in the earlier half of the century, before the shoals of Grey Mullet (*Mugil capito*) forsook Breydon, owing to the great silting up of that basin. Two on Filby Broad, Sept. 20th, 1898. were observed fishing.

Phalacrocorax carbo. Cormorant.—N. C. According to Sir Thomas Browne this species nested in trees at Reedham, "from whence Charles the First was wont to be supplied" (Nor. N. S. vol. iv. p. 417). Till within a year ago, "we had (at Herringfleet) always more or less Cormorants with us all the year round, but more especially in winter" ('Rough Notes on Natural History,' by H. M. L.), in 1825 there were several nests there. It occasionally follows the Herring shoals, and I have observed odd birds on Breydon in spring. Six were seen there on May 25th, 1890, and seventeen on May 19th, 1892.

P. graculus. Shag.—R. R. "Very rare," according to Messrs. Paget. May be more frequent after the Herring shoals than is observed. I procured one alive on March 28th, 1898, from a fishing-smack, which became an interesting pet. It ate 2½ lb. of fish per diem., vomiting the more indigestible bones. Another, brought me alive on Nov. 11th, 1899.

Sula bassana. Gannet.—C. "Not uncommon; several were shot in the roads after the severe gale of Oct. 31st, 1827" (Paget). Is now fairly common out at sea during the fishing season. An adult specimen secured on Breydon, Sept. 24th, 1865. I have observed several washed ashore at different times, three as recently as Dec. 8th, 1899; these were possibly drowned, and thrown out of the Herring-nets.

Ardea cinerea. Common Heron.—C. Does not appear to have greatly diminished of late years. The Mautby heronry has disappeared since 1874, but a new one exists at Reedham. I have frequently seen upwards of twenty Herons at a time feeding in company on Breydon flats, where they may be watched catching Eels and Flounders. Local, "Hernsher."

A. purpurea. Purple Heron.—A. "Has been killed three or four times" (Paget). An example, "Breydon, 1856 or 1857"

(Connop Catalogue). Other occurrences:—Ludham, October, 1865; Yarmouth, October, 1878 (Nor. N. S.).

A. ralloides. Squacco Heron.—A. "One caught in a bow-net that was hanging out to dry by Ormesby Broad, December, 1820" (Paget). Dates also given:—Oulton, May, 1831; Ormesby, 1834.

Nycticorax griseus. Night-Heron. — A. "Mr. Youell has known six or seven to have been shot here at different times" (Paget). "Three specimens of this Heron were killed on the North Denes" (B. of N. vol. ii. p. 175). An example obtained on Caister marshes, Nov. 8th, 1860 (*ibid.*), and another was shot at Rollesby Bridge on Nov. 8th, 1899.

Ardetta minuta. Little Bittern.—R. Messrs. Paget enumerate three examples obtained in this neighbourhood. It doubtless nested on the Broads early in the century. "A Little Bittern was shot at Runham, near Yarmouth, on the 10th of October, 1889" (Nor. N. S.). On July 3rd and 4th, 1893, two males in full plumage shot at Rollesby (*ibid.*); one, Oct. 9th, 1896.

Botaurus stellaris. Common Bittern.—R. R. The drainage of the Norfolk swamps has greatly decreased the number of these birds of late years. Last Norfolk eggs were discovered March 30th, 1868. A young bird in August, 1886 (Nor. N. S.). Two or three immigrants occasionally brought to market in winter. Local, "Bottle-bump."

Ciconia alba. White Stork.—A. Messrs. Paget mention a pair shot on Burgh marshes in the summer of 1817, and two earlier occurrences. An accidental spring and autumn visitor. One shot at Oby, May 24th, 1865 (Connop Catalogue). Several others have been met with; a tired-out individual was seen resting on a housetop, June 26th, 1892.

C. nigra. Black Stork. — A. One shot on Breydon, June 27th, 1877, by John Thomas, punt-gunner.

Plegadis falcinellus. Glossy Ibis. — A. "A pair shot at the mouth of the Norwich river, Sept. 13th, 1824; . . . there were three or four more in company with them" (Paget). Stevenson records two or three others for this neighbourhood, the last being killed at Stalham on Sept. 13th, 1868.

Platalea leucorodia. Spoonbill.—N. U. The Messrs. Paget, writing in 1834, after mentioning that a flock of these birds were seen on the marshes in 1774, and several others killed in 1808, state that two or three are generally shot every spring on Breydon; the latter statement might apply to the present day, save that, happily, they are more frequently allowed to depart in peace. During the last twelve summers Mr. J. H. Gurney states that ninety-three Spoonbills have visited Breydon (Nor. N. S. vol. vi. p. 514). Sixteen were seen there on May 13th, 1894: and on May 5th, 1895, twelve appeared. On May 10th, 1899, I rowed to within a short distance of six which were feeding in a flock on the edge of a mud-flat. Twelve on Breydon, June 4th, 1900; and subsequently several others. Local, "Banjo-bill."

Anser cinereus. Grey-lag Goose.—R. R. A winter migrant, once nesting in the fens. Messrs. Paget refer to it as "very common," which is far from being the case in the present day. Stevenson records single examples as follow:—November, 1847, at Horsey; April, 1849, on Breydon; September (?), 1854, Yarmouth; March, 1862, on Caister marshes; and in March, 1864, at Ludham—two examples; and a third at Horsey same year. One was killed by a gunner named Gibbs on Sept. 24th, 1881. Babington speaks of several flocks seen on Breydon, Sept. 24th and 25th, two birds being shot (B. of S.).

A. albifrons. White-fronted Goose. — N. C. An uncertain visitor; I find generally two or three examples brought to market every winter, usually immature.

A. segetum, Bean Goose. — F. C. "Less frequently met with" [than Grey-lag] (Paget). An uncertain winter visitant; in some years none, in others several. Several seen late in January, 1892.

A. brachyrhynchus. Pink-footed Goose. — N. C. Have observed it occasionally in the market. In some years none; in very severe weather more frequent than any of the preceding. Five were shot out of a flock, Feb. 14th, 1879; I also saw two immature, Dec. 11th, 1880. Two on Dec. 20th, 1890.

Bernicla ruficollis. Red-breasted Goose.—A. "Mr. Wigg," says the Messrs. Paget, "accidentally bought a specimen of this bird in the market, which, to his constant regret, he plucked and cooked."

(To be continued.)

NOTES FROM POINT CLOATES, N.W. AUSTRALIA.

By Thomas Carter.

Since my last notes appeared in 'The Zoologist' (1899, p. 139), Mr. A. J. Campbell's description of the new species of Emu Wren (*Stipiturus ruficeps*), with a beautiful plate of the bird, was published in the 'Ibis,' July, 1899. There is little doubt that Mr. Keartland found the same species on the late Wells expedition, but, unfortunately, the skins obtained had to be abandoned in the desert, with many others. So far, I have only seen this bird on one limited part of a high rugged range that abounds with masses of large prickly spinifex and scrub, though apparently the whole length of the range (about seventy-five miles) offers similar conditions. I saw several of these birds there in July last, but failed to secure eggs or any particulars as to their breeding habits. It is surprising to see these tiny birds run, and occasionally fly, headlong into the dense prickly masses of spinifex, and thread their way through the countless spines like mice, without being impaled. One showery day, my native and self came upon a party of these birds, and succeeded in hunting one down and catching it alive, its feathers having become drenched with wet. One other new species I may claim for last year, *viz.* Western White Plumed Honey-eater (*Ptilotis leilavalensis*). I forwarded a skin to Mr. Campbell, as for some time I suspected it differed from *P. pencillata*, the eastern type, but had no skin to compare.

A specimen of the same species was forwarded to Mr. A. J. North about the same time from North Queensland, and the bird was named (differently) by both gentlemen. It is one of the commonest and most noticeable birds on all the rivers and white gum creeks where water lodges, from the Gascoyne River to here, and doubtless its range extends across the tropics. In fact it is so abundant that for some years I never even closely examined a specimen, never imagining it was likely to be a new species, which shows how carefully one should work in new country. It is of very sprightly, inquisitive habits, constantly uttering its pleasant liquid warbling note from earliest dawn until dark. It has a harsh alarm-note, and is quick to sound it on the approach of a dog, hawk, or biped, and all within hearing will hurry up to help the first bird to scold.

The second week in July I paid a visit to the nearest gum creek that contains good pools of water, in search of nests (the eggs being then undescribed), and was fortunate in finding five—three with a clutch each of two eggs, one with two newly hatched young, and one ready for laying. The nests were of light construction, of fibrous roots and grass, mixed and lined with vegetable down and sheeps' wool, and suspended about three feet from the ground, either in the dense prickly acacia bushes, or sort of large salt bush that grows round water holes there. In the rushes surrounding these pools were nests containing eggs of the Black-tailed Tribonyx (*Microtribonyx ventralis*).

About February 14th, last year, some flocks of White-fronted Chats (*Ephthianura albifrons*) arrived here, but only stayed a few days. It is the first time they have come under my notice. Keartland's Honey-eater (*Ptilotis keartlandi*) was fairly common on the high country behind the range, but I found no nests. I may mention that a skin of this bird was sent by me from here to Melbourne in 1890 for identification; but it was not until 1895 that Mr. Keartland secured specimens, when it was recognized by Mr. North as a new species.

On July 28th one of my men went to Frazer Island in the boat, and returned with more than two hundred eggs, all fresh, of the Pied Cormorant (*Phalacrocorax varius*). They were a welcome addition to our meals for some days. The nests are built in thick, spreading bushes, with large, soft, greenish grey leaves, that grow only on the edge of the sea.

In August, White-eyed Crows (*Corvus australis*), Kestrels (*Tinnunculus cenchroïdes*), Brown and Rufous Larks (*Cinclorhamphus cruralis* and *rufescens*), Tri-coloured Chats (*Ephthianura tricolor*), Brown Hawks (*Hieracidea occidentalis*), Pipits (*Anthus australis*), Singing Honey-eaters (*Ptilotis sonora*), and Grass Parrakeets (*Melopsittacus undulatus*) were breeding numerously. I visited a new nest of Spotted Harrier (*Circus assimilis*), but it contained no eggs; and found a nest of White-shouldered Caterpillar-eater (*Lalage tricolor*), with young, high up in a white gum sapling.

Yellow White Eyes (*Zosterops lutea*) were common, and I shot specimens occasionally through the winter up to August 6th, to see if they were breeding, but came upon no indications until February 13th, this year, when I shot a male in some mangroves near the N.W. Cape, with testicles much enlarged. When we were shearing in September, a tame cat brought in a black-fronted Dottrel (*Ægialitis melanops*), which was breeding, doubtless, on the adjoining salt-marsh.

On October 19th a pair, male and female, of the scarce Red-kneed Dottrel (*Erythrogonys cinctus*) fell to one discharge of my gun, at an inland creek. They had one or two others with them, doubtless young of the year. The Sandpipers referred to in my last paper (Zool. 1899, p. 142) were kindly identified for me by Mr. Campbell as the Grey-rumped Sandpiper (*Heteractitis brevipes*). They were common all the summer, especially in November; on the 2nd I killed eight with one shot, in company with other waders.

During the prevalence of heavy southerly gales in December, Silver Gulls (*Larus novæ hollandiæ*) forsook the beach, and were feeding on beetles on the high open country some miles from sea. On December 20th, after some parching east winds, an Oriental Pratincole (*Glareola orientalis*) settled on the beach near the house. So far, this is the south and west record.

In January, 1900, a Yellow-billed Albatross (*Thalassogeron chlororhynchus*), and, a little earlier, a Giant Petrel (*Ossifraga gigantea*), were picked up dead on the beach—a long way north for these birds.

In February last I took a trip towards the N.W. Cape. On the way a very heavy N.E. blow set in, with every indication of a hurricane, but the latter did not arrive. There were numbers of Lesser Frigate Birds (*Fregata minor*) blown down. A party of eight flew a few feet over my head, making their way north again; unluckily, I had just strapped my gun to buggy ready to move on. There were numbers at sea, and that night by moonlight I saw several flying north, and also the next day. They only occur here when hurricanes are about. Black-cheeked Falcons (*Falco melanogenys*), too, made their appearance in some numbers, and flocks of Oriental Pratincoles. The latter soon left us. In a large mangrove swamp near the Cape, Pelicans, Egrets, Ducks, Mangrove Bitterns, and Waders were in numbers. I secured specimens of Red-capped Dotterel (*Ægialitis ruficapilla*) and Sharp-tailed Stints (*Heteropygia acuminata*), which I have never seen on the beach here. Sacred Kingfishers (*Halcyon sanctus*) were common on the coast in February; they visit us yearly about then: are they migratory? On February 20th natives brought in a Hoary-headed Grebe (*Podiceps nestor*), which they had caught on the beach. It was very poor, and a sign of bad drought inland. Fortunately this drought broke in March, and between March 10th and date of writing—April 21st—we have had fifteen inches of rain. The inland clay, flat country is flooded and impassable for miles.

At a large gum flat twenty-five miles east of here, which is now full of water, I last month shot, with other birds, the following interesting species:—White-headed Sea Eagle (*Haliastur girrenera*), Little Eagle (*Nisætus morphnoides*), Owlet Nightjar (*Aegotheles novæ-hollandiæ*), Black-eared Cuckoo (*Misocalius osculans*), Red-browed Pardalote (*Pardalotus rubricatus*), Variegated Wren (*Malurus lamberti*), Red-rumped Tit (*Acanthiza pyrrhopygia*), Little Black Cormorant (*Phalacrocorax sticto-cephalus*), Plumed Whistling Duck (*Dendrocycna eytoni*), Black-capped Tree-runner (*Sittella pileata*), Marsh Tern (*Hydrochelidon hybrida*), Oriental Pratincole (*Glareola orientalis*). The two latter species were in large flocks at my first visit, and I hoped would breed there, but when revisited a few days ago saw only one Marsh Tern. The Pratincoles were balls of fat. Some Straw-necked Ibis (*Geronticus spinicollis*) and White-necked Herons (*Ardea pacifica*) were there, and some Black Swans. Nests of Teal (*Nettion castaneum*) were plentiful in the hollow gum-trees, with eight or nine eggs. A Red-rumped Kingfisher (*Halcyon pyrrhopygius*) I shot had several large scorpions in its gizzard.

Last month I was at the Minilya River, and secured specimens of the Red-breasted Babbler (*Pomatorhinus rubeculus*), and saw a colony of their nests (old) in a large white gum close to the station-house. On July 26th, last year, I found an Osprey's nest with the unusual number of four eggs, all beautifully marked.

The nest was placed on a boulder about three feet high, in the bed of a strong creek where it emptied into the sea. Later in the season I saw a nest in a still more exposed position, *viz.* on the bare surface of a large open salt-marsh near the end of a salt-pool. The rugged range, before mentioned, was within half a mile of both these nests, and high scrubby sandhills still closer, so it is strange the birds should choose such absurdly accessible places. Doubtless, the reason is, that months or a year may pass without a human being visiting there.

This being a season of rain that may not occur again in a generation, birds should be plentiful; and I hope in the course of the year to have opportunities of making other interesting notes. No more Rabbits have been seen here.

NOTES AND QUERIES.

MAMMALIA.

Lesser Shrew in Cambridgeshire.—In September, 1899, I obtained two batches of pellets of the Barn-Owl from nesting places in hollow trees at Wisbech St. Mary. They yielded respectively one and four skulls of the Lesser Shrew (*Sorex minutus*), in addition to remains of the Common Shrew, Water Shrew, Bank, Field, and Water Voles, Long-tailed Field-Mouse, Common Mouse, Brown Rat, and House-Sparrow. The Lesser Shrew, although probably not uncommon, does not appear to have been often noticed in the fens. Jenyns, quoted by Miller and Skertchly in 'The Fenland Past and Present,' says, "I have taken it in a single instance in Horningsea Fen, but not elsewhere." — CHARLES OLDHAM Alderley Edge).

Lesser Shrew and Bank Vole in Berks.—In answer to Mr. W. H. Warner's enquiry (*ante*, p. 381), I am pleased to be able to inform him that the Lesser Shrew (*Sorex minutus*) is certainly found in this part of Berkshire; I have taken it, but not recently. I much regret I have no skin by me at present. I am not certain about *Microtus glareolus*. The number of *Mus sylvaticus* that infests my garden is quite extraordinary; on one small herbaceous border I caught over seven hundred last year. It is almost impossible to grow yellow crocuses, though they are not nearly so hard on the bulbs of other coloured varieties, and never touch narcissus roots.—HEATLEY NOBLE (Temple Combe, Henley-on-Thames).

Insectivorous Habits of the Long-tailed Field-Mouse.—During the winter months Long-tailed Field-Mice (*Mus sylvaticus*) resort in numbers to the narrow horizontal tunnels in the sandstone rock connected with the disused copper mines on Alderley Edge. In November, 1898, when I first noticed the Mouse-holes among the heaps of loose stones, and the impressions of multitudes of little feet in the dry sand of the tunnel-floors, I was at a loss to think what had induced the Mice to adopt the life of troglodytes. A feeble light penetrates some of the main tunnels, but in the side workings it is pitch-dark at all times of the day, and here footprints were numerous in places more than a hundred and fifty yards from the outer air. The piles of gnawed hips and blackberry-seeds in birds' nests in the woods outside showed that food was plentiful enough there, but in the tunnels there were not even fungi on which the Mice could feed, and the drippings from the candles of casual trippers did not seem sufficient to account for their presence. Besides two moths, *Gonoptera libatrix* and *Scotosia dubitata*, which are fairly abundant, a gnat (*Culex*), two flies (*Blepharoptera serrata* and *Borborus niger*), and possibly other insects, hybernate in countless numbers on the roofs and walls of the tunnels. That the Mice frequent the place in order to feed upon the insects was clear from an examination of the stomachs of several which I trapped. Wings and empty skins of the gnat and flies, as well as legs of the moths, were easily identified in their half-digested contents. In some cases vegetable matter was present in addition, and, as the footprints were present from end to end of the tunnels, it appears that the Mice obtain part of their food in the woods; whilst the burrows in the tunnels themselves seem to indicate that they actually live in their recesses for the time being, and do not merely visit them to prey upon the insects they find there. Even in June there are flies in thousands on the walls of the tunnels, but during the summer months I have failed to trap any Mice, nor are there then any fresh tracks to be seen in the sand.—CHARLES OLDHAM (Alderley Edge).

AVES.

Mistle-Thrush laying twice in the same Nest. — Last season I obtained a clutch of four eggs belonging to *Turdus viscivorus* from a nest near Bath. On visiting it again a short time afterwards—I think at about a week's interval—I found the bird had laid in the same nest a second time, laying two or three eggs. I was unaware that the Mistle-Thrush would return to its robbed nest, and should be interested to hear if others have met with similar instances. It is quite possible another pair of Mistle-Thrushes may have appropriated the vacant nest.—CHARLES B. HORSBRUGH (Marlock, Somerset).

The Bearded Titmouse: a Correction.—In the article on the Bearded Titmouse (*Panurus biarmicus*), *ante*, p. 359, Mr. Gurney says "John Ray published the first notice and description of this family of birds in 1674 (a scarce book.)" May I point out that in a much earlier work (now before me in my library), by Conrad Gesner "De Avibus," 1575, there are illustrations given of all the known Tits, with full descriptions. Seven are portrayed. The woodcuts are very quaint, and the volume is in folio, and in Latin. I expect Ray knew this book well, for he wrote and published his work just one hundred years later than Gesner.—E. L. J. RIDSDALE (The Dene, Rottingdean, near Brighton).

The Bearded Tit and other Birds in Norfolk.—I have just read Mr.

Gurney's most interesting paper on the Bearded Tit (*Panurus biarmicus*), *ante*, p. 358. I do not know how Mr. Bird arrived at the conclusion that there were only thirty-three nests in Norfolk in 1898, and I hope he has understated the number, or that they have increased since then. I know one small broad which has been most strictly preserved for some years, and where even the entomologist is not allowed, though it is sometimes difficult to keep him out! Here the Bearded Tits have increased in a most satisfactory manner. A pair or two might always have been seen. On May 7th, 1899, I found a nest with seven young just ready to fly, and there were at least two pairs with young. On May 3rd this year I saw one nest from which the young had just flown, and I watched both parent birds for some time. It was blowing very hard, and as I crouched in the reeds the male bird settled within a few feet; a beautiful sight it was to see him preening his feathers in the sunlight. On another part of the same broad I saw at least three pairs feeding young, or carrying excrement from the nests; further still I saw other birds feeding in the rushes, and I thought at the time there were at least six pairs on this broad. Quite ten pairs of the Great Crested Grebe (*Podicipes cristatus*) might have been counted. Over thirty male Wild Ducks rose as we rounded a sharp corner; several pairs of Shoveler (*Spatula clypeata*) were nesting, and I had the pleasure of seeing a Marsh-Harrier (*Circus æruginosus*). The keeper assured me he had never seen one of these birds here before. Montagu's Harriers try to rear their young here every year, but the nest is cut out, or the old birds are shot, though this season I have hopes that they got off. A pair of Kestrels were nesting in an old windmill. "They'll 'ave to die," said the keeper. It was no use my telling him that they did far more good than harm, and the fact that he caught two or three of these birds with Mice in their claws at the same spot last season in nowise impressed him; so I took the eggs, in the hope that the old birds might find more hospitable quarters elsewhere. I placed the four eggs in an incubator, and one was hatched in twenty-nine days. I never allow Kestrels to be killed at home, unless caught red-handed at the Pheasant-coops; and it is a curious fact that whereas each year we are obliged to destroy more than one of these birds, a pair of Sparrow-Hawks are continually flying over the rearing-field; neither my keepers nor myself have ever known them touch a Pheasant, though they often take young Sparrows and other small birds that are attracted by the Pheasant food. We never molest them, and I doubt not most keepers would think us quite mad. Whilst in Norfolk I noticed several of those indiscriminate instruments of torture, "pole-traps"; they were not set, and, on asking the reason, I was informed that they had caught five Snipe in them the week previous to my visit.—HEATLEY NOBLE (Temple Combe, Henley-on-Thames).

Nesting of the Great Tit (Parus major).—April 29th. Nesting-box containing nest of Great Tit and five eggs. May 2nd, 8 a.m. Eight eggs; old bird absent, and not looked at again to-day. May 3rd, 7 p.m. Found old one sitting without addition to clutch. May 13th, 1 p.m. Eight eggs still in nest. May 14th, 6 p.m. Six young hatched; two eggs remain. May 30th. Between 6 a.m. and 7 a.m. the old birds visit the nest with food, sixty-four times within the hour; when leaving nest they invariably left for further supplies in an opposite direction. Feeding at this rate is not carried on throughout the day; they may sometimes be absent for a considerable time. Feeding commences about 4 a.m., and finishes about 7 p.m. June 2nd. The brood complete of eight young left their nest. In all probability the old one would commence incubation on May 2nd, with a result of twelve days, and an addition of, say, nineteen days for the young to remain within the nest.—J. STEELE-ELLIOTT (Clent, Worcestershire).

Nesting of the Common Sparrow (Passer domesticus). — Yarrell mentions the first batch of eggs laid usually consists of five to six; Morris practically quotes the same words; Macgillivray gives the laying four to six; Saunders states five to six; Seebohm goes one better, and says five to seven. My personal experience is that a clutch of six is most unusual, and does not happen in even one per cent. of nests containing the full laying. Nests with a clutch of four are about as numerous as those with five, and a remarkable quantity have a full complement of only three, at a rough estimate, say, fifteen per cent. There are many other remarks with which, after considerable experience, one does not care to agree, as, for instance, Seebohm adds it is probable that with those birds that build domed nests in branches of trees the habit is hereditary. He also adds that the Sparrow often sits upon the first egg as soon as laid; my experience being that, if the nest is placed in a hole, then the female will roost at the side of the nest, but in no way adding to their incubation until (taking, for instance, the laying of a clutch of five) the evening following the laying of the fourth egg, when incubation starts. Yarrell evidently infers that the early layings of the Sparrow contain the largest clutches of eggs. This is by no means invariably the rule; most frequently the same number is laid both in the second and third layings, and occasionally, as in this year, two nests containing six followed the robbery of the first laying, when previously nothing more than five could be found. Yarrell points out that the Sparrow may occasionally be seen in winter carrying materials to the holes they inhabit; this is evidently only for sleeping accommodation. The actual nesting commences as early as the first week in March, the complete lining of feathers not being added for many weeks hence, and then not until several eggs have been laid. Laying usually commences with great regularity in the Midlands during the second week in May. Three broods are usually reared if no molestation takes place; if the first two layings are robbed, even then two broods will be reared. When a nest and eggs are destroyed, it takes but ten days before another nest is built, and five more eggs are deposited. The number of young reared would not average much beyond three to a brood.—J. STEELE-ELLIOTT (Clent, Worcestershire).

Nesting of the Starling (Sturnus vulgaris). — March 29th. Starling clearing out some of the old materials from last year's nesting-site. April 28th. Two eggs in nest. April 30th, 6.30 p.m. Four eggs; old bird within the nest, and eggs seemed slightly warm, but possibly she had not actually started incubation, as many birds nesting in holes roost on the side of the nest at night. May 1st. Sitting on five eggs. May 11th, 6.30 p.m. Five eggs still in nest. May 12th, 7.30 p.m. Four young hatched; other egg infertile. May 25th. Feeding young seems to average about fifteen times to the hour, and this I think almost regularly throughout the day of some fourteen hours' duration; at least, whenever I was watching, the old birds never seemed to cease their labours. Being able to conceal myself close to the nest, I gained the full advantage of watching the young being fed within a foot of me. The food (which at this period seemed to consist almost entirely of a large white larva, but, owing to the rapidity with which the food was given, it was impossible to identify it), when brought to the nest, was given to whichever young one clamoured most, and held a foremost position at the entrance to nest, the one frequently taking several feeds in succession, until pushed aside by another which by now had become still more eager in its hunger. Almost invariably after the food had been taken the old bird would wait a moment to allow of that particular young one turning round and voiding any excrement; if this failed, then a rapid search of the nest, and other excrement, if any, removed; in the brief meantime the old bird probably having undergone a severe course of pecking from the insatiable and impatient young. June 1st. All the young left nest. June 11th. The old ones again back at nest, but no further indication of a second brood took place. Reckoning from May 1st, the incubation lasted eleven days; but if such commenced on the evening of April 30th, and the last was the infertile egg, then incubation in this instance covered twelve days, and the young remained in the nest twenty days.

Particulars of another pair slightly vary:—May 6th, 7 p.m. Three eggs; old bird flew from nest. May 7th, 8 a.m. Three eggs in nest and cold; 7 p.m., four eggs and bird within nest. May 12th. Probably owing to my too frequent visits, the eggs had previously been forsaken, and this day I find the birds have removed them from the nest. May 12th. A Starling's egg placed by myself within the nest was also removed. May 18th, 7 p.m. Another three eggs in nest. May 19th, 10 a.m. Four eggs; bird flew out of nest, the eggs being warm. May 30th, 7.30 p.m. Four eggs remain in nest. May 31st, 8 a.m. One young and three eggs; 7 p.m., three young and one egg; this constant interference causing them to again forsake. In this instance incubation had lasted at least twelve days.—J. Steele-Elliott (Clent, Worcestershire).

Cuckoo in the Shetlands.—On Aug. 8th I caught a young fully-fledged Cuckoo (*Cuculus canorus*) on the lawn in front of this house, where it was feeding. The bird was very tame (perhaps it knew that the Wild Birds Protection Act is in force in Shetland until the end of this month!) I have seen and heard the Cuckoo in and about the shrubbery many times during the past two months.—T. Edmondston Saxby (Halligarth, Unst, Shetland).

Common Buzzard (Buteo vulgaris) shot in Hertfordshire.—I regret that I have previously omitted to record the shooting of a Common Buzzard in Hertfordshire on Jan. 27th last. It was a male bird, and measured three feet from tip to tip, wing measurement, and turned the scale at two ounces short of two pounds. Mr. Spary, the local taxidermist, remarked to me that the bird was as fat as butter, and had probably been feasting in some rich game-preserves. He told me also that all the Hawks and Owls he had had through his hands were never very fat, and that the case of the Buzzard under notice was a singular exception. I have promised not to divulge the exact locality where the bird was shot, as the keeper is afraid of "marching orders" should it reach the ears of his employer.—W. Percival Westell (5, Glenferrie Road, St. Albans, Herts).

Nesting Habits of the Sparrow-Hawk.—In treating of an issue in this connection (*ante*, p. 381), Mr. A. H. Meiklejohn has awakened in me a responsive chord. No bird have I followed and studied more industriously in the breeding season than *Accipiter nisus*. Perhaps, then, as I aspire to the credit of knowing something about the species in question, a corner may be found for this communication, though I would wish, quite modestly, to say at the outset that Mr. Meiklejohn is mistaken in fancying that attention has never yet been called in print to the particular traits in the Sparrow-Hawk's economy so recently adverted to by him. Some four years ago a monthly publication, 'The Ornithologist' by name, entered on a somewhat precarious and certainly brief existence, and in its pages a very animated discussion was maintained for upwards of six months concerning the nesting economy of the Sparrow-Hawk. I should like to be allowed to reproduce in these columns the gist of what I wrote in the May number of that magazine for 1896, as I have had no reason subsequently to alter or even modify the views then expressed. They were the outcome of many years' assiduous and unrelenting study of Sparrow-Hawks in their woodland haunts during the breeding season, and should go to prove that the habit to which Mr. Meiklejohn specifically refers has not always *hitherto* been shrouded in obscurity. I have found and critically examined many scores of Sparrow-Hawks' nests, and have taken hundreds of their eggs, and in the whole of my experience I cannot recall to mind a single case in which the parent birds had not resorted to the old and discarded nests of some other species. These same nests, erstwhile the possessions of Ring-Doves, Carrion-Crows, and Magpies, generally presented a very ragged appearance previously to adaptation, being tattered and torn by the storms and gales of winter. "*Long ere the leaf is out*—sometimes, indeed, *as early as the end of March*—mental selection is unquestionably made of the nest that is eventually to be used as a breeding-site." At dawn, and again at the approach of dusk, the birds are frequently to be found in its vicinity, either soaring high in the air, and occasionally uttering sharp screams as they wheel to and fro, or else perched in the trees beneath. "*With the advance of spring* they will be found busy at the nest itself, apparently cleaning and patching it up, while in course of time there is superimposed a shallow and very extended structure of twigs and sticks, in which receptacle the eggs are laid." The substructure or basis is entirely the handiwork of some other species, the superstructure that of the Sparrow-Hawks themselves. The birds gather the supplementary materials chiefly from beneath the tree, flying up and down in turn, as I have repeatedly proved by watching them from an ambush. The eggs are laid on alternate days, six being the largest clutch I have taken, though I have secured as many as fifteen and sixteen from single nests, the first egg of the latter number having been laid on May 1st, and the last on May 31st; so that, by judicious manipulation of the nest and its contents, I had induced the bird into laying an egg on every other day throughout that traditionally merry month. It will generally be found that one egg in a clutch differs appreciably in the markings from the remainder; sometimes it is altogether devoid of colouring matter, while at others a considerable portion of its bluish-white ground is blushed over with brown of a much paler shade than that with which the rest of the eggs in the clutch are usually so handsomely clouded and blotched. Sparrow-Hawks begin to sit about May 10th, in Leicestershire, or about six weeks after the first overtures have been made to the nest that has been selected. So far as I have been enabled to test the point, the eggs—which are exceedingly thick-shelled—are seldom hatched before the expiration of five weeks. The ultra-extended platform built by the Sparrow-Hawks themselves, and superadded to the relics of the nest of some other species, is assuredly a beautiful expression of the instinct when considered in relation to its use at a subsequent stage. Nevertheless, the fact that this roomy plateau not only does duty as a repository for freshly-killed prey, but as a family banqueting-table, whither the young periodically return for many days after they are fledged and gone out into the world, appears to be too obvious a feature in the economy of the species to be even incidentally noted by any of the so-called popular writers on the birds of these islands!

Before concluding, I must explain one little matter. I have spoken of the hundreds of Sparrow-Hawks' eggs that I have taken, but it must be remembered that the species is notoriously baneful to shooting interests, and that gamekeepers wage a war of extermination against it at all seasons. On many and many an occasion my plundering of a nest has sufficed to save the bird's life; whereas, had I not been present to plead for mercy and climb to the nest, the brooding bird would have been ruthlessly shot on the spot, and the beautiful eggs left to their fate. Such interposition profited the owners of the various nests equally with myself, seeing that they were allowed to escape with their lives, and subsequently laid eggs elsewhere for my appropriation. It may appear strange, but it is none the less absolutely true, that the old female Sparrow-Hawk, from whose nest I abstracted the fifteen eggs, got to know me, through my repeated visits to her home in a Scotch-fir, so well that at the last she never troubled to leave the nest until my head was on a level with it. It was only on the occasion of my final "call" that she evinced real indignation, however, and for a moment the situation was not pleasant when she faced round and unfolded her wings at the distance of a few inches only. What a wicked eye she turned on me, too, but that was the full extent of her hostility. — H. S. Davenport (Melton Mowbray).

Quail in Cheshire. — Several times during the latter half of July I heard the liquid trisyllabic note of the Quail (*Coturnix communis*) near Wilmslow. On one evening four or five birds were calling on Lindow Moss, and in the surrounding fields.—Chas. Oldham (Alderley Edge).

Quail in Hertfordshire.—A Quail (*Coturnix communis*) was picked up dead outside the post-office here in May, 1899, by one of the city police, it evidently having come in contact with the telegraph-wires. — W. Percival Westell (5, Glenferrie Road, St. Albans, Herts).

Black-tailed Godwit (Limosa belgica) in Hants.—On Aug. 20th, whilst out in my punt in the harbour, I shot three Black-tailed Godwits; they were feeding on some very soft and rotten mud. One bird which I weighed scaled 8¾ oz.—John Stares (Portchester).

Rough Notes on Derbyshire Ornithology, 1899–1900.—Although the winter of 1898–1899 was so mild, large flocks of Bramblings were reported from different parts of the county. A single shot fired out of curiosity into a large flock not far from Derby, on Jan. 26th, 1898, brought down no fewer than fourteen. On Jan. 27th I saw a nicely set-up Slavonian Grebe at Hutchinson's shop, which had been killed at Allestree towards the end of the previous November. A Little Auk was also received at the same time, taken in an emaciated state on the moors outside Sheffield, and now in the Sheffield Museum. Mr. Storrs Fox obtained a Rook (about the beginning of February) "whose upper mandible was very much elongated, being about 1¼ to 1½ in. longer than the lower one. This additional part was narrow and curved downwards after the manner of a Chough's beak. The bird was put into an aviary, but was killed by a Rat the same night." The bones of the skull proved to be normal in size and shape, the long tip being composed of horny covering alone. The Chiffchaff was singing in the Ashburne district by March 30th, and Sand-Martins were noticed on April 6th. Owing to the mild weather Lapwings began to lay earlier than usual, and eggs were found before the end of March. Long-tailed Tits were exceedingly numerous in the spring of 1899, and more nests were found than in any year I can remember. The Grasshopper-Warbler was absent from its usual breeding haunts; generally six or seven pairs are to be found within a radius of three or four miles, but in 1899 and 1900 none of the old breeding places were tenanted. A Carrion-Crow's nest, found on April 15th, contained a single egg. The tree showed no signs of having been previously climbed, and on the 20th a single young Crow occupied the nest. As the clutch of the previous year had only consisted of two eggs, perhaps they were the produce of an almost barren pair. Mr. H. G. Tomlinson noticed a Swift at Burton on May 4th, and on the following day Mr. Storrs Fox saw one at Ashford lake. The Swift is perhaps the most regular in its visits of any of the migrants, and often returns literally to the day.

Under date of April 17th, Mr. Storrs Fox writes that one of the keepers in his neighbourhood saw a Great Grey Shrike "about a fortnight ago." He had a shot at it, but it flew away. On May 10th a Dotterel was picked up under the telegraph-wires on the Nottingham road just outside the town of Derby (*cf.* 'Field,' May 20th, 1899). It was an adult in spring plumage, and, with the exception of those mentioned in 'The Zoologist' for 1894, is the only specimen recorded from the county during the last twenty years. Waterhens' nests are often built some distance from the ground, but on May 11th I came across one quite sixteen feet up a large chestnut on the shore of Calwich Abbey Pond. Another nest at Yeldersley contained thirteen eggs, but, though they were of much the same type, of course they may have been the produce of more than one bird. In addition to the breeding places of the Tufted Duck mentioned in 'The Zoologist,' 1899, p. 476, they have also established themselves at Bradley, a couple of miles to the east, and with a few years' protection would probably become numerous in the district. As it is, most of the young birds of the year are shot, and the increase is hardly perceptible. A Willow-Wren's nest at Shirley Vicarage was built in a small dead spruce, three feet from the ground.

This is the only nest out of some seventy which I have seen which was quite clear of the ground, though I remember one built among ivy at the bottom of a wall which did not rest on but was just above a path. On the other hand, it is not uncommon to see Chiffchaffs' nests from three to seven feet from the ground, and I have seen one ten feet high in the trellis on the side of a house. A male Jackdaw paired with a female Magpie at Bentley, and actually built a nest, but soon afterwards deserted it, perhaps on account of being disturbed. They were repeatedly seen together, and the Jackdaw has been observed to feed the Magpie. The Jackdaw is an escaped bird, and had been noticed associating with Magpies during the previous winter. The nest, which was built by the Magpie, was of the usual type, but had no roof, and when deserted had no clay lining. During the winter of 1899–1900 many Bitterns were shot in different parts of the country. Through Mr. G. Pullen, I heard of one which was shot at Morley in November, 1899; and Mr. Hutchinson has recorded two others in the 'Field' as having been "lately" (Jan. 30th) shot at Egginton and Smalley. In November, 1899, a watcher named Hudson picked up a dead bird in the grounds of Wootton Lodge, Staffordshire, which, from his description, appeared to be a Fork-tailed Petrel. It was apparently starved to death. Mr. J. Masefield, of Cheadle, has kindly traced this specimen, which luckily was preserved, and has ascertained that the supposition was correct. It is now in the possession of Mr. Mears, of Longton.

1900.—The very severe weather in February proved destructive to the birds. Many dead Chaffinches, Blackbirds, and Starlings were to be found by the roadsides as the snow melted. It was a curious sight to see the Tree-Creeper diligently searching the churchyard-wall in the very middle of the village, and so engrossed in its task that it allowed one to stand within a yard or two of it. An enormous flock of Wood-Pigeons, consisting of many hundreds of birds, frequented the Ramsor Woods till late in March. A curious incident which took place on March 18th seems to show that there is more affection between birds than is commonly supposed. A cock Blackbird was found lying dead outside a window at 10.15 a.m. Probably it was killed by flying against the window, as blood was oozing from its bill, its feathers were unruffled, and wings outspread. The hen stood by the dead body, and actually allowed itself to be touched with a stick by my brother-in-law, only uttering a mournful note. He then picked it up, but replaced it on the ground by its mate. Twenty minutes later he found it still by the dead bird, but, on gently touching it with his foot, it flew easily away, and skulked among the bushes. Two hours later the dead bird had disappeared (possibly picked up by a Dog). Many species of birds seem to have suffered from the severe weather of February. The Long-tailed Tits, which were so common the previous year, were almost exterminated, and the same may be said of the Golden-crested Wrens. Curiously enough, the number of eggs laid by our common birds seemed to be fewer than usual. Very few Thrushes' or Blackbirds' nests contained more than four eggs, and often only three were found; while I have found nests with only two young birds. On April 18th a Brown Owl was found nesting in the fork of a tall spruce in Dovedale. The nest was quite open, and the Owl could be seen from the hillside above. Nearly all the nests in this district are in holes of trees, but I have seen a Brown Owl's nest on the ground under the shelter of a small rock in a wood in North Wales. While returning from a visit to a Sparrow-Hawk's nest on May 12th, I heard a clear, ringing, quickly-repeated note, quite unlike that of any of our common birds. Directly afterwards the chatter of a Mistle-Thrush and the Lapwing's cry called my attention to three birds flying rapidly up the valley close together, with regular swift beats of the wing. As they passed me I had a good look at them, and noticed their pale faded brown colour and somewhat Gull-like-shaped wings. They flew straight and fast, and were soon out of sight. At the time I thought they were Sand-Grouse; in fact, I know of no other bird that could be mistaken for them. Black Grouse still breed in small numbers in this neighbourhood. A nest with six eggs was found on May 16th on the Staffordshire side. On May 17th I visited the site of the Raven's nest in Howdenchest, which is mentioned by Seebohm ('British Birds,' vol. i. p. 49). Although it is nearly forty years since the nest was last used by the Ravens, the remains of the nest are clearly visible. One of the keepers told me that he saw a Raven on his beat about April 5th. It was circling round a lambing ewe, and flew right away out of sight. He had also noticed Short-eared Owls above Mulbrook in the autumn of 1899. A Hawfinch's nest, which was found in Clifton on May 26th, contained three incubated eggs, and was built nearly at the top of a good-sized sycamore close to the roadside. The hen sat close, and the nest was only discovered by accident. The Merlins made another attempt to breed on the Grouse moors of North Derbyshire, but the nest with four eggs (almost hatching) was found, and I believe both birds were trapped. A Common Sandpiper's nest found on June 17th, with two eggs chipping and two newly-hatched young, was placed on the side of the railway embankment between Clifton and Norbury, only eight feet from the metals. The old bird was running along the sleepers, and only took wing when a passing train was within a few yards of it. The eggs which were chipped had the largest fragments of the broken shells neatly fitted on to the small ends. The nest was about one hundred and fifty yards or so from the River Dove. On Aug. 4th two large white birds flew over Clifton at a good height, which were almost certainly Gannets. The previous day had been very stormy.—FRANCIS C. R. JOURDAIN (Clifton Vicarage, Ashburne, Derbyshire).

Ornithological Notes from the Wilsden District (Yorkshire).— *Pratincola rubicola.* Stonechat.—A male bird was seen near Keighley last Easter. It is somewhat curious that this species should so seldom make its appearance in this district, which seems so very suitable in every respect, and scarcely at any other season except early spring, and exceptionally rare as a nesting species.

Sylvia curruca. Lesser Whitethroat.— Although regarded as being generally distributed in Yorkshire, it is a very rare and local visitant to this neighbourhood, only two instances having come to our knowledge—one found by two of my sons in Beckfoot Lane, near Bingley, some years ago; and, curiously enough, I found a nestling last year (1899) within a few yards of the same place.

Phylloscopus rufus. Chiffchaff. — Exactly the same remarks apply to this species as the Stonechat. A few years ago a clutch of eggs were brought to me, which had been taken in Bingley Woods, which bore a striking resemblance to this species, and might have been so; if so, it is the only instance known to me of its breeding here.

P. trochilus. Willow-Wren. — A gamekeeper was describing a nest to me the other day which he had found built against the trunk of an oak at least two yards from the ground, and in all probability was referable to this species. I have found the nest in two instances built at some distance from the ground.

Locustella nævia. Grasshopper-Warbler. — One of my sons heard this bird last May in the Aire Valley, near Bingley. It may breed here more commonly than is supposed, but I have never been so fortunate as to find its nest.

Lanius excubitor. Great Grey Shrike. — One was shot in the Goit Stock Valley last autumn, and another killed in the same valley some twenty years ago; these, with one seen near Shipley by my brother and myself, are the only records.

Muscicapa atricapilla. Pied Flycatcher. — One (male) observed last May (1900) by one of my sons near Bingley. Occasionally seen on migration, but very rarely breeds. It is, however, local but abundant in the next valley (Wharfedale).

Coccothraustes vulgaris. Hawfinch. — Saw two individuals last year (1899) in Bingley Wood. One of my sons and myself, a few weeks ago, found two nests within a short distance of each other in Wharfedale. There is no doubt about its extending its range northwards, as it is much more common than even a few years ago.

Carduelis elegans. Goldfinch.—Seen by one of my sons near Bingley last winter. Rather an irregular winter visitant with us. It is said to have nested here formerly, but does not now.

Linota cannabina. Linnet.—Much lesss common than formerly, but the partial disappearance of whin-covers may to some extent account for their comparative scarcity.

L. flavirostris. Twite.—Even more striking in its scarcity as compared with former years, and more unaccountably so than the last species.

Loxia curvirostra. Crossbill.—A pair were seen last May or June (1899) in Upper Wharfedale, but I cannot ascertain that any nest was actually found, although it is probable it may have occurred in the beautiful pine-woods which abound there.

Sturnus vulgaris. Starling. — A few more appear to winter with us than formerly, although much more abundant both in winter and summer in some years than others. It often leaves its breeding haunts where it can be observed in colonies without any apparent reason. Mr. Forrest, in 'The Zoologist' (*ante*, p. 140), remarks:—"Careful observation has convinced me that a very large proportion of Starlings, perhaps one-half, rear only one brood in the year." In this district it is practically single-brooded. A few may not improbably have two broods in one season, but such instances are rare. A good many are sometimes seen in flocks when others are breeding, and have been for some time, but, as the season advances, gradually disappear, perhaps to breed in higher latitudes; and it may be more apparent than real that a good many "never breed at all." I have been asked if three Starlings occasionally feed the young belonging to one nest; one person here stoutly maintains he has repeatedly had ocular demonstration of the fact. Although it is not at all an uncommon thing to see three birds about one nest, I have never once been satisfied that more than two ever engaged in feeding the young.

Dendrocopus major. Great Spotted Woodpecker. — Has been more than usually common of late years; whilst the Green Woodpecker, on the other hand, has become much scarcer—indeed, I have not observed a single specimen for some years.

D. minor. Lesser Spotted Woodpecker.—A very rare visitant. One, however, was seen in Bingley Wood last May, and the keeper thinks it may be breeding, as he saw it again only the other day. It is about twenty years since last record for this district.

Cuculus canorus. Cuckoo.—During the past year (1899), and up to the present, the only species of birds which have come to my knowledge in the nests of which the Cuckoo has deposited its eggs are the Meadow-Pipit and Whinchat. It seldom lays its egg or eggs in any other species except these two in this district. I recently found a young Cuckoo nearly fully fledged in the nest of a Titlark. One of my sons observed that the foster-parents were feeding it chiefly upon the heath-moth. A good many years ago, on a heathy waste near here, I watched a Cuckoo come repeatedly to the nest of a Whinchat—at least, I should think, a dozen times—and then flew away; but at last, on going up to the nest, I found it had deposited an egg. The nest was in such a position, access being by a long narrow winding passage, that it could not have been deposited in the nest in the usual way, but must have been conveyed by the beak; and, as far as I can remember, one egg of the Whinchat was missing. I think that there can be little doubt but that it occasionally robs birds' eggs; but the question arises—"Is it a common habit to rob eggs except from nests where it intends to deposit its egg?" Our evidence on this point is decidedly in the negative. Nests of various species abound on Blackhills, where the Cuckoo is also abundant, and very seldom an egg is missing from any nest; and it is certain, if eggs constituted an important item in its bill of fare, such a propensity could not so long have escaped notice. One thing is certain, *viz.* that it very seldom selects a nest in which to deposit its egg where the eggs are in an advanced stage of incubation; and this suggests another question, *viz.* "How does the Cuckoo ascertain when the eggs are fresh; or, rather, when such condition obtains as to induce her to deposit her egg?"

Asio otus. Long-eared Owl.—A nest was found with young in May (1899) in a fir-tree, but as a breeding species it is not at all common; perhaps, however, more so than formerly.

Falco æsalon. Merlin.—A friend brought one here last winter, which was presumed to have flown against the telegraph-wires, and in a few days became as tame as one which had been brought up from the nest. It could eat enormous quantities of food for its size.

Eudromias morinellus. Dotterel. — Mr. Ellison, of Steeton, having informed me that this species had bred recently on the moors above Keighley, a young bird having been sent to Mr. Mosley, of Huddersfield, for identification, I wrote to Mr. Mosley, requesting him to furnish me with any particulars in his possession. He replied stating that the young bird in question was certainly a Dotterel, but that there was no ground for coming to the conclusion that it must of necessity have been bred in the vicinity where it was caught, as in his opinion, judging from its size, it could have flown from some distance. Mr. Walker, of Appletrewick, in Upper Wharfedale, informs me that it has bred near there for two or three years, which is rather an unlikely habitat.—E. P. BUTTERFIELD (Wilsden, Yorkshire).

PISCES.

Opah at the Shetlands.—An Opah, or Sun-fish (*Lampris luna*), was caught at West Voe, Dunrossness, on the mainland, on July 20th.—T. EDMONDSTON SAXBY (Halligarth, Unst, Shetland).

NOTICES OF NEW BOOKS.

Yearbook of the United States Department of Agriculture, 1899. Washington: Government Printing Office.

THE Government of the United States of America is to-day a greater scientific publisher than that of any other State in the world. Its voluminous Reports are also scattered with the greatest generosity in every scientific centre, and though the term "exchange" is used, the actual debit must be largely on the side of our American cousins. We have just received the above, consisting of 880 pages, strongly bound and beautifully illustrated, and though of the greatest importance to the agriculturist, its zoological information is not inconsiderable. In noticing three contributions only, it must be understood that they appertain to our special studies, and are for that reason selected.

"Some Examples of the Development of Knowledge concerning Animal Diseases" is the title of a contribution by Mr. D. E. Salmon. This paper is necessarily largely pathological, but it is a full and excellent *résumé* of the evolution of scientific methods and discoveries; while its estimate of the earlier theories as structures without stability, representing "the individual workings of the philosopher's mind rather than the truths of nature," will apply to much thought of the present day.

"Progress in Economic Entomology in the United States" is the subject of a paper by Dr. L. O. Howard. At the beginning of the present century the United States, with its population of only 5,000,000, and its restricted husbandry, suffered comparatively little from the attacks of insects on its crops. But now the conditions are vastly altered. Increased cultivation has been accompanied by a multiplication of plant-eating insects; many pests have been imported; and now, as "the century has grown older, the need of remedies against insects has grown greater." The State has not, however, neglected its duties. "During the calendar year 1898, for example, sixty-one separate publications were issued by the different State experiment stations, either devoted entirely to matter on economic entomology, or containing articles upon the subject, the total number of pages on applied entomology reaching nearly 1400. During the same period nineteen separate publications on economic entomology were issued by the Department of Agriculture, containing a total of about 1000 printed pages." A notice of some of the principal workers is given, and excellent photographs of Asa Fitch, Townend Glover, T. W. Harris, B. D. Walsh, and C. V. Riley will be welcomed by many entomologists; while "Remedies" will be valued by the agriculturist.

Mr. T. S. Palmer has written "A Review of Economic Ornithology in the United States." The history of American ornithology may be traced back to the middle of the sixteenth century, though a great starting point may be established by the publication of Catesby's 'Nat. Hist. of Carolina, Florida,' &c., in 1731–43. A host of well-known names can be recalled since that time, but it appears to be only about the year 1850 that economic ornithology attracted attention. "As a result of fourteen years' work, the Biological Survey has brought together a collection of about 32,000 bird stomachs, of which some 14,000 have been examined. This article constitutes a fund of information respecting the destruction of birds by excessive egg collection, and by the demand for feathers established by feminine vanity.

Bulletin of the United States Fish Commission. Vol. xviii. for 1898.
Washington: Government Printing Office.

THIS is really a lovely quarto volume, with its exquisite views of Alaskan lakes and scenery, and is a storehouse of information on many branches of economic ichthyology. A large section is devoted to "The Salmon and Salmon Fisheries of Alaska," and this portion is, apart from its zoological information, a practical guide to the waterways of the country. The account of "The Southern Spring Mackerel Fishery of the United States" is replete with interest, and is written by Mr. Hugh M. Smith. The schools of Mackerel usually approach the coast of the United

States in the latter part of March or early in April, and are generally first seen by the fishermen off the coast of North Carolina, in the region of Cape Hatteras. The year 1885 was a remarkable one in annals of American fishing; it was a period of glut in Mackerel. About 175 vessels were engaged in the fishery, and to New York alone probably no fewer than 850 trips, all told, were made; these averaged from 140 to 150 barrels each, so that during the season about 125,000 barrels of fresh Mackerel were landed in that city, this quantity representing about 31,250,000 fish.

The reappearance of the Tile-fish (*Lopholatilus chamæleonticeps*) is detailed by Dr. Bumpus. Most naturalists are familiar with the facts of the recent sudden appearance and subsequent disappearance of this fish; and it was included by Mr. F. A. Lucas in his memoir on "Animals recently extinct or threatened with extermination, as represented in the Collections of the U.S. National Museum." Recent investigations have shown that the area of the distribution of the Tile-fish "probably extends from 69° to 73° west longitude, and along a band of the sea bottom of varying width, and from seventy to eighty fathoms in depth, although no tests were made in deeper water." It is also clearly a "warm water" fish.

The usual American enterprise has been exhibited in all things pertaining to economic ichthyology. The demand for fresh Herring as bait in the Cod fisheries led, in 1890, to the building of a number of freezing-houses along the New England coast, where shore Herrings are frozen during the fall, and kept for use during the winter and early spring; while "The Mussel fishery and pearl-button industry of the Mississippi River," already referred to in the pages of the 'Zoologist' (1899, p. 480), receives ample and well-illustrated treatment, and again proves that man's interference with nature has not yet reached its full dimensions.

EDITORIAL GLEANINGS.

Two notices of changed feeding habits in birds found in South and East Africa have recently been published. The first, by Prof. E. Ray Lankester, appeared in 'Nature' (Aug. 16th), and refers to the common Rhinoceros-bird (*Buphaga erythrorhyncha*), as observed by Capt. Hinde, of the British East African Protectorate. This bird formerly fed on Ticks and other parasites which infest game and domestic animals; occasionally, if an animal had a sore, the birds would probe the sore to such an extent that it sometimes killed the animal. Since the cattle plague destroyed the immense herds in Ukambani, and nearly all the sheep and goats were eaten during the late famine, the birds, deprived of their food, have become carnivorous, and now any domestic animal not constantly watched is killed by them. Perfectly healthy animals have their ears eaten down to the bone, holes torn in their backs and in the femoral regions. The second report relates to the South African Vulture, and is contributed to the 'Field' of Sept. 1st by H. L. Lempriere, of Natal. He writes:—"It is probable that the disappearance of the enormous herds of game that used to roam at will over the veld has caused a change of habit in this bird, and that the scarcity of carrion has forced it to seek its food in a manner so unnatural and abhorrent as to cause every man's hand to be turned against it. Be that as it may, the fact remains that, as surely as the lambing season comes round, so surely large flocks of Vultures appear, and, circling and wheeling in the air above the ewes, seize the opportunity when the poor creatures are in their most helpless condition to attack them, pick out their eyes, and eventually kill both lamb and ewe with the most frightful torture conceivable. Only the most unremitting care and attention during the lambing season can prevent the most serious losses from this cause, and the rifle and shot-gun, and even poison, are freely used to destroy these repulsive birds. Nor are ewes the only victims. Foaling mares are killed in the same frightful manner, and I have personally seen a flock of Vultures following on the ground a heifer that was about to calve, awaiting their opportunity. The plaintive lowing of the terrified beast attracted my attention, and I was fortunately able, by the aid of a few well-placed bullets, to prevent another tragedy of the veld by dispersing the loathsome crew."

THE breeding of the Cuckoo in the London district is now a well-established fact. Mr. C. J. Cornish, writing from Orford House, Chiswick

Mall, to the 'Times,' at the end of July, states:—"For some years Cuckoos have been in the habit of visiting the osier-bed on Chiswick Eyot very early in the morning. This eyot runs into the London county boundary. I always suspected that they were seeking nests to lay their eggs in. Three weeks ago, when on the lawn by this house by the river, I heard a young Cuckoo screaming for food in a privet-bush hanging over the river. Looking among the thick branches with a glass, I could see its orange maw, and two unhappy Sedge-Warblers working overtime putting food down its throat. It was fully fledged, and could fly. For three weeks this bird has remained in this and adjacent gardens by the river, being fed all the time by the Sedge-Warblers. Every evening it took a flight up and down the river, apparently practising and testing its strength. When hungry it screeched at the rate of just one hundred screeches per minute, which had such an effect on the nerves of other birds that I have seen even the irreclaimable Sparrows fly down, peck up food, and fly into the thick bush where it was, though I did not see them feed it. 'In July away he fly' is part of Cuckoo lore. It is now known that the young Cuckoos leave first. This one, whose evening flights have been daily more extended, has gone. I dare say among the birds of Chiswick Eyot it is regretted as a 'fashionable departure.'"

THE above was at once supplemented, in the 'Daily Mail,' by Mr. A. E. Day, of Highgate Hill, who wrote:—"Mr. Cornish's young Cuckoo at Chiswick is not unique. Young Cuckoos have been hatched in Highgate Cemetery this year. In one instance several of us watched a Hedge-Sparrow's nest in which a Cuckoo had laid an egg, and the little bird sat and hatched out that one egg. Although the bird left the nest on July 23rd, it may still be seen flying about the cemetery, fed by the Hedge-Sparrows. At least two Cuckoos, to my knowledge, have been hatched here this season."

THE reintroduction of the Great Bustard (*Otis tarda*) seems to be inaugurated in Norfolk, and the following letter from Lord Walsingham has appeared in the 'Norfolk Chronicle':—

"Sir,—An attempt is being made to reintroduce the Great Bustard in what was formerly one of the favourite haunts of this fine bird on the borders of the Norfolk fens. This effort is due to the public spirit of an English gentleman resident abroad, whose love of natural history has induced him to incur considerable expense and trouble in the matter. It is hoped that residents in Norfolk and Suffolk will agree to respect the birds, which will probably be at large before this letter appears, and by preventing their destruction will secure the success of an experiment to which the reintroduction of the Capercailzie in Scotland affords a parallel instance and an encouraging precedent.—WALSINGHAM. Aug. 14th."

We trust that these birds may be allowed to survive, though as a commentary to the desire we extract the following note from 'The Shooting Times' (Aug. 25th):—"A Portsmouth sportsman thought he had made a lucky haul a few days ago. His eagle eye detected five fine Storks disporting themselves on a local waste, and, after much trouble, he succeeded in stalking them, and bagged the lot. He took the rare birds to a taxidermist, and a day or two later learned that the Storks had escaped from Sanger's circus, which was visiting the neighbourhood."

We regret to learn the death of Dr. John Anderson, M.D., F.R.S., which took place very suddenly at Buxton on Aug. 16th. For the following particulars we are largely indebted to the 'Athenæum.' John Anderson was born in Edinburgh in 1833. He was educated for the medical profession, and in 1861 took the degree of M.D. of Edinburgh University. His strong taste for natural history, however, led him definitely to abandon his career as a medical man when, in 1864, he was offered the curatorship of the newly founded Indian Museum in Calcutta. In 1868, and again in 1874, he was selected by the Government of India to act as scientific officer to an expedition into Western China; and in 1881 he was sent by the Trustees of the Indian Museum to investigate the fauna of the Mergui Archipelago in Tenasserim. Since his return from India, in 1887, Dr. Anderson, acting under medical advice, spent the winters in the south, and his periodical visits to Algeria and Egypt roused in him an interest in the fauna of North Africa and Arabia, which has proved of the greatest benefit to science. He defrayed the costs of a collector to accompany Mr. Theodore Bent's expedition to the Hadramaut; and of late years much of his wealth and time has been devoted to the preparation of a series of volumes upon the vertebrate zoology of Egypt, which his untimely death leaves uncompleted.

The friends of the late Sir William Flower, K.C.B. (Director of the Natural History Museum and President of the Zoological Society of London), are anxious to place a memorial of his great services to science in the Whale Room of the Natural History Museum—one of the departments in which he was most interested, and to which he devoted special care and attention. The memorial would, subject to the consent of the Trustees of the Museum, consist (probably) of a bust and a commemorative brass tablet. It is thought that Sir William Flower's many friends and admirers would be glad to associate themselves with this undertaking. In order to carry it out an influential Committee has been formed. Subscriptions may be paid to the Treasurer, Dr. P. L. Sclater, at 3, Hanover Square, London, W. It has been agreed that each subscription should not exceed £2 2s.

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